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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/838,429	04/19/2001	Charles Jay Alpert	AUS920010118US1	3587

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EXAMINER

CRAIG, DWIN M

ART UNIT	PAPER NUMBER
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2123

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/838,429

Applicant(s)

ALPERT ET AL.

Examiner

Dwin M Craig

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 4/19/2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 9-13 and 17-21 is/are rejected.
- 7) ☒ Claim(s) 6-8, 14-16 and 22-24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Claims 1-24 have been presented for Examination.

#### **Claim Rejections - 35 USC § 112**

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Dependent **Claims 5, 13 and 21** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Although the submission of Figure 7 and the description in Applicant's specification provide enabling support for the formula in dependent claims 5, 13 and 21, with in the claims themselves there is no disclosure as to what the "*meets and bounds*" are for the disclosed terms, "*b(v)*, *p(v)* and *B(v)*". Amendment and clarification are required.

#### **Double Patenting**

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

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Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Independent Claims 1, 9 and 17 in combination with dependent Claims 2, 10 and 18 are rejected under the judicially created doctrine of double patenting over claims 1, 8 and 15 of U. S. Patent No. 6,401,234 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent. For Example presented here is a mapping of the first claim from the application and from the issued U.S. patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: A method for designing buffer and wire replacement in an integrated circuit, which is functionally equivalent to a method for routing interconnects "wires" within an integrated circuit design having blockages or buffer bays "tile graphs" utilizing a Steiner tree routing algorithm "constructing a Steiner tree for each net to determine congested regions, claim 2 of U.S. patent Application 09/838,429" selecting a two-path exceeding a threshold high cost; and re-routing said selected two-path with a lower cost two-path "wherein the nets two-path are routed through selected tiles and assigned buffer locations using a cost minimization algorithm. It is noted by the Examiner that the 09/838,429 application is claiming the genus "cost minimization algorithm and the 6,401,234 patent is claiming the species "selecting a two-path exceeding a threshold high cost; and re-routing said selected two-path with a lower cost two-path".

Thus, it would have been obvious, to one of ordinary skill in the art, at the time that the 6,401,234 Patent was issued, to have derived the claimed subject matter in Independent Claim 1 and dependent Claim 2 of the 09/838,429 application.

4. Independent Claims 1, 9 and 17 in combination with dependent Claims 2, 10 and 18 are rejected under the judicially created doctrine of double patenting over claims 1, 20, 39 and 45 of U. S. Patent No. 6,591,411 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent. For Example presented here is a mapping of the first claim from the application and from the issued U.S. patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: A method for designing buffer and wire replacement in an integrated circuit, which is functionally equivalent to a method of determining a wiring pattern for related buffer insertion in a circuit design, from claim 2 of the 09/838,429 application, the step of routing nets between associated sources and sinks which is functionally equivalent to clustering "tile graphs or selected tiles" sinks of the circuit design based on similarities of one or more characteristics of the sinks into one or more clusters "tiles", Generating a local wiring pattern in a Steiner tree format for each cluster "tile", "constructing a Steiner tree for each net to determine congested regions, claim 2 of U.S. patent Application 09/838,429". The Examiner asserts that a "tile" is functionally equivalent to a "cluster."

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Thus, it would have been obvious, to one of ordinary skill in the art, at the time that the 6,591,411 Patent was issued, to have derived the claimed subject matter in Independent Claim 1 and dependent Claim 2 of the 09/838,429 application.

**Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Independent **Claims 1, 9 and 17** and dependent **Claims 2, 10 and 18** are rejected under 35 U.S.C. 102(b) as being anticipated by **Varadarajan et al. U.S. Patent 5,838,583**

5.1 As regards independent **Claims 1, 9 and 17** the *Varadarajan et al.* reference teaches, routing (**Figures 19a, 19b and 19c, Col. 2 Lines 28-43**), tiles (**Figure 2 Items 311, 313, Col. 25 Lines 27-58**), cost calculations (**Figure 16b item 253, Col. 23 Lines 4-37**).

5.2 As regards dependent **Claims 2, 10 and 18** the *Varadarajan et al.* reference teaches Steiner trees (**Col. 25 Lines 1-11**).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this

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subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Independent **Claims 1, 9 and 17** and dependent **Claims 2, 3, 4, 10, 11, 12, 18, 19 and 20** are rejected under 35 U.S.C. 102(e) as being anticipated by **Nitta et al. Pub. No. US 2001/009031**.

6.1 As regards Independent **Claims 1, 9 and 7** the *Nitta et al.* reference teaches, a method for designing buffer and wire placement in an integrated circuit (**Figure 5, paragraphs 0002 & 0003**), representing the surface of a integrated circuit as a tile graph (**Figure 1-4 and paragraphs 0015, 0016, 0017, 0018, 0019, 0020 and 0021** which teach “blocks” which are functionally equivalent to “tiles”), receiving an allocation of buffer locations for selected tiles in the tile graph (The Examiner notes that it would be inherent that buffers would be placed on an integrated circuit and that the reference discloses routing of “cells” **Figure 5 Item 16**), routing nets between associated sources and sinks “a prohibiting region” is functionally equivalent to a “sink” (**Figures 12A, 12B, 12C**), selectively assigning buffer locations within selected tiles (**Figures 17B, 17A paragraph 0069**), assign(ing) buffer locations using a cost minimization algorithm (**Figures 15A & 15B**).

6.2 As regards dependent **Claims 2, 10 and 18** the *Nitta et al.* reference discloses *Steiner trees* (**paragraph 0010**).

6.3 As regards dependent **Claims 3, 4, 11, 12, 19 and 20** the *Nitta et al.* reference discloses (**paragraph 0030**), which teaches checking wiring capacity through a particular path to avoid path congestion.

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7. Independent **Claims 1, 9 and 17** and dependent **Claims 2, 10 and 18** are rejected under 35 U.S.C. 102(e) as being anticipated by “**Manhattan or Non-Manhattan? A study of Alternative VLSI Routing Architectures**” by Cheng-Kok Koh and Patrick H, Madden hereafter referred to as the *Koh et al.* reference.

7.1 As regards independent **Claims 1, 9 and 17** the *Koh et al.* reference teaches, routing (page 47 & page 48), tiles (page 48), cost calculations (page 51).

7.2 As regards dependent **Claims 2, 10 and 18** the *Koh et al.* reference teaches Steiner trees (page 48).

#### **Allowable Subject Matter**

8. Dependent **Claims 5-8, 13-16 and 21-24** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Examiner further notes that dependent **Claims 5, 13 and 21** have 35 U.S.C. 112<sup>nd</sup> paragraph rejections.

#### **Conclusion**

9. **Claims 1-24** have been presented for Examination. Independent **Claims 1, 9 and 17** and dependent **Claims 2, 3, 4, 5, 10, 11, 12, 13, 18, 19, 20 and 21** have been rejected. Dependent **Claims 5-8, 13-16 and 21-24** have been objected to. This Office Action is **Non-Final**.

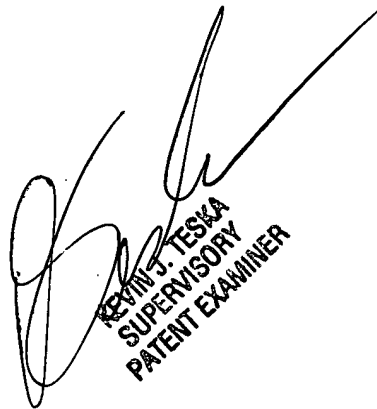
9.1 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwain M Craig whose telephone number is (571) 272-3710. The examiner can normally be reached on 10:00 - 6:00 M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached on (571)272-3716. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DMC



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